CLAIMS

WE CLAIM:

1. A stator for a rotating electrical machine, comprising:

a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface;

at least two longitudinal slots formed in the inner circumferential surface of the stator core; and

at least one stator coil having a first slot-insertion segment and a second slot-insertion segment interposed by a non-slot-insertion segment, the first and second slot-insertion segments extending parallel to one another in a first plane and inserted, one each, within a separate slot, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment,

wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane.

2. The stator of Claim 1, wherein the non-slot-insertion segment is generally V-shaped and includes an apex at a predetermined position thereon.

3. The stator of Claim 2, wherein the apex is located on the twisted segment.

4. The stator of Claim 1, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments generally toward the outer circumference of the stator core.

5. The stator of Claim 1, wherein the predetermined number of degrees of the twist is approximately 180°.

6. The stator of Claim 1, wherein the predetermined angle of the bend is approximately 45°.

7. A stator for a rotating electrical machine, comprising:

a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface;

at least two longitudinal slots formed in the inner circumferential surface of the stator core; and

at least one stator coil having a first slot-insertion segment and a second slot-insertion segment interposed by a generally V-shaped non-slot-insertion segment, the first and second slot-insertion segments extending parallel to one another in a first plane and inserted, one each, within a separate slot, the non-slot-insertion segment having an apex formed thereon at a predetermined position,

wherein the apex is bent at a predetermined angle relative to a second plane that is parallel to the first plane, and includes at least a portion therof that is twisted a predetermined number of degrees.

8. The stator of Claim 7, wherein the non-slot-insertion segment includes a first non-twisted segment and a second non-twisted segment interposed by the apex.

9. The stator of Claim 7, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments generally toward the outer circumference of the stator core.

10. The stator of Claim 7, wherein the predetermined number of degrees of the twist is approximately 180°.

11. The stator of Claim 7, wherein the predetermined angle of the bend is approximately 45°.

12. A rotating electrical machine, comprising:

a rotationally mounted rotor; and

a stator surrounding the rotor, the stator including:

a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface,

at least two longitudinal slots formed in the inner circumferential surface of the stator core, and

at least one stator coil having a first slot-insertion segment and a second slot-insertion segment interposed by a non-slot-insertion segment, the first and second slot-insertion segments extending parallel to one another in a first plane and inserted, one each, within a separate slot, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment,

wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane.

13. The machine of Claim 12, wherein the non-slot-insertion segment is generally V-shaped and includes an apex at a predetermined position thereon.

14. The machine of Claim 13, wherein the apex is located on the twisted segment.

15. The machine of Claim 12, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments generally toward the outer circumference of the stator core.

16. The machine of Claim 12, wherein the predetermined number of degrees of the twist is approximately 180°.

17. The machine of Claim 12, wherein the predetermined angle of the bend is approximately 45°.

18. The machine of Claim 12, wherein the machine is configured as a generator.

19. The machine of Claim 12, wherein the machine is configured as a motor.

20. A coil for insertion into a stator core, comprising:

a first slot-insertion segment extending in a first plane;

a second slot-insertion segment extending parallel to the first slot-insertion segment in the first plane; and

a non-slot-insertion segment coupled to the first and second slot-insertion segments together, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment,

wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane.

21. The coil of Claim 20, wherein the non-slot-insertion segment is generally V-shaped and includes an apex at a predetermined position thereon.

22. The coil of Claim 21, wherein the apex is located on the twisted segment.

23. The coil of Claim 20, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments.

24. The coil of Claim 20, wherein the predetermined number of degrees of the twist is approximately 180°.

25. The coil of Claim 20, wherein the predetermined angle of the bend is approximately 45°.

26. A method of assembling a stator core for a rotating electrical machine, the method comprising:

providing a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface;

forming at least two longitudinal slots in the inner circumferential surface of the stator core;

providing at least one stator coil having:

a first slot-insertion segment extending in a first plane,

a second slot-insertion segment extending parallel to the first slot-insertion segment in the first plane, and

a non-slot-insertion segment coupled to the first and second slot-insertion segments together, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment, wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane; and

inserting the first and second slot-insertion segments, one each, within a separate slot.